U.S. Army
Environmental
Center

NO FURTHER ACTION DECISION UNDER CERCLA

STUDY AREA 43F
HISTORIC GAS STATION SITES

FORT DEVENS, MASSACHUSETTS

CONTRACT DAAA15-91-D-0008

U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND

JANUARY 1995

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Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland
Contract DAAA15-91-0008

Prepared by:

ABB Environmental Services, Inc.
Portland, Maine
Project No. 7053-12

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EXECUTIVE SUMMARY

Investigations of Study Area 43F (Historic Gas Station Site) at Fort Devens, Massachusetts have resulted in the decision that no further hazardous waste studies or remediation are required at this site. Study Area 43F was identified in the Federal Facilities Agreement between the U.S. Environmental Protection Agency and the U.S. Department of Defense as a potential site of contamination.

Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act as amended by the Superfund Amendments and Reauthorization Act on December 21, 1989. In addition, under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens was selected for cessation of operations and closure. In accordance with these acts, numerous studies, including a Master Environmental Plan, an Enhanced Preliminary Assessment, and a Site Investigation, have been conducted which address Study Area 43F.

Field investigation of Study Area 43F was initiated in 1992 in conjunction with the other 12 Groups 2, 7, and Historic Gas Stations Study Areas at Fort Devens. The Study Area 43F site investigation consisted of collecting subsurface soil samples and soil gas samples for field analysis. Surficial geophysical surveys were not conducted at SA 43F because the historic gas station is located under the current Post Exchange building.

Nine TerraProbe points were advanced along the three accessible sides of the Post Exchange building to seek evidence of possible migration of residual contamination away from the site of the historic gas station (see Figure 2-2).

Seven soil samples were collected from 9 feet and three soil samples were collected from 15 feet. Only one sample was collected from 20 feet due to subsurface obstructions. All of the soil samples collected from SA 43F were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes and total petroleum hydrocarbons. Because the water table was not reached in any of the soil sampling TerraProbe points, soil gas samples were collected from all nine locations and field-screened for benzene, toluene, ethylbenzene, and xylenes only. No soil borings or monitoring wells were completed at this site.

On the basis of findings at Study Area 43F and the Preliminary Risk Evaluation, there is no evidence or reason to conclude that petroleum contamination due to the former

underground storage tank has caused significant environmental contamination or poses a threat to human health. The decision has been made to remove Study Area 43F from further consideration in the Installation Restoration Program.

1.0 INTRODUCTION

This decision document has been prepared to support a no further action decision at Study Area 43F - Historic Gas Station Site (SA 43F) at Fort Devens, Massachusetts. The report was prepared as part of the U.S. Department of Defense (DoD) Base Realignment and Closure (BRAC) program to assess the nature and extent of contamination associated with site operations at Fort Devens.

In conjunction with the Army's Installation Restoration Program (IRP), Fort Devens and the U.S. Army Environmental Center (USAEC; formerly the U.S. Army Toxic and Hazardous Materials Agency) initiated a Master Environmental Plan (MEP) in 1988. The MEP consists of assessments of the environmental status of SAs, specifies necessary investigations, and provides recommendations for response actions with the objective of identifying priorities for environmental restoration at Fort Devens. The Historic Gas Station Sites were identified in the MEP as potential areas of contamination. On December 21, 1989, Fort Devens was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act.

An Enhanced Preliminary Assessment (PA) was also performed at Fort Devens to address areas not normally included in the CERCLA process, but requiring review prior to closure. A final version of the PA report was completed in April 1992. In 1992, DoD, through USAEC, also initiated a Site Investigation (SI) for SA 43A through S along with the other 12 SAs in SA Groups 2 and 7 at Fort Devens. The SI was conducted by ABB Environmental Services, Inc. (ABB-ES).

Under Public Law 101-510, the Defense Base Realignment and Closure Act of 1990, Fort Devens has been selected for cessation of operations and closure. An important aspect of BRAC actions is to determine environmental restoration requirements before property transfer can be considered. Studies at SA 43F were conducted to support this overall mission.

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2.0 BACKGROUND AND PHYSICAL SETTING

2.1 DESCRIPTION AND LAND USE

Fort Devens is located approximately 35 miles northwest of Boston, Massachusetts, within Middlesex and Worcester counties. The installation consists of approximately 9,280 acres and includes portions of the towns of Ayer, Harvard, Lancaster and Shirley. Cities in the vicinity include Fitchburg, Leominster and Lowell. Land surfaces range from about 200 feet above mean sea level (MSL) along the Nashua River in the northern portion of the installation to 450 feet above MSL in the southern portion of the installation.

Fort Devens was established in 1917 as Camp Devens, a temporary training camp for soldiers from the New England area. In 1931, the camp became a permanent installation and was redesignated as Fort Devens. Throughout its history, Fort Devens has served as a training and induction center for military personnel and a unit mobilization and demobilization site. All or portions of this function occurred during World Wars I and II, the Korean and Vietnam conflicts, and operations Desert Shield and Desert Storm. The primary mission of Fort Devens is to command, train, and provide logistical support for non-divisional troop units. The installation also supports that portion of the U.S. Army Intelligence School located at Fort Devens, for the Army Readiness Region, for Reserve Components, and for Army Reserve and National Guard in the New England area.

Fort Devens currently consists of three major land use areas: Main Post, South Post, and North Post (Figure 2-1).

The majority of the facilities on Fort Devens are located in the Main Post area, north of Massachusetts Highway 2. The Nashua River intersects the Main Post along its western edge. The Main Post provides all of the on-post housing, including over 1,700 family units and 9,800 bachelor units (barracks and unaccompanied officer's quarters). Other facilities on the Main Post include community support activities (such as a shoppette, cafeteria, post exchange, commissary, bowling alley, golf course, and hospital), administrative buildings, classrooms and training facilities, maintenance facilities, and ammunition storage facilities. The Historic Gas Station Sites, including SA 43F, are located on the Main Post.

The South Post is located south of Massachusetts Highway 2 and contains individual training areas designated for troop training, range activities, and a drop zone. The Nashua River bounds the South Post on the northeast side.

The North Post is directly north of the Main Post. The principal activities on the North Post are the Douglas E. Moore Army Airfield, and the installation Waste Water Treatment Plant.

2.2 REGIONAL GEOLOGY

Fort Devens is near the western boundary of the Seaboard Lowland Section of the New England-Maritime Physiographic province (Jahns, 1953). It is adjacent to the Worcester County Plateau of the Central Uplands province and part of the installation lies within the province (Koteff, 1966). The land surface is almost completely covered with unconsolidated glacial outwash deposits, resulting in few bedrock outcrops. The surficial deposits are underlain by a highly complex assemblage of intensely folded and faulted metasedimentary rocks with occasional igneous intrusions. The geomorphology of the region is dominated by glacial features such as outwash plains, kames, kame terraces, drumlins, and eskers.

2.3 REGIONAL HYDROGEOLOGY

Groundwater at Fort Devens occurs largely in the permeable glacial-deltaic outwash deposits of sand, gravel, and boulders. Well yields within these sediments are dependent upon the hydraulic characteristics of the aquifer and can range from 2 to over 300 gallons per minute (gpm). Small amounts of groundwater can be obtained from fractured bedrock with yields ranging from 2 to 10 gpm. Minor amounts of groundwater may be found in thin, permeable glacial lenses elsewhere on the installation. The primary hydrogeologic feature at Fort Devens is the Nashua River, which flows through the installation in a south to north direction, with an average discharge rate of 55 cubic feet per second. In addition to the Nashua River, the terrain is dissected by numerous brooks with attendant wetlands. There are also several kettle ponds and one kettle lake located within the installation.

2.4 STUDY AREA DESCRIPTION AND HISTORY

SA 43F, one of the 19 Historic Gas Station Sites, is included in the Group 2 SAs located on the Main Post. The structures of the historic gas station at SA 43F consisted of a pump island and a small gasoline pumphouse. Based on historic records, the gas station was a Type A station with one 5,000-gallon underground storage tank (UST) located between the gasoline pumphouse and the pump island. The location of the historic gas station at SA 43F was within the footprint of what is now the Post Exchange (PX) Main Store (Building 2021) (Figure 2-2). The PX is located in the central portion of the Main Post approximately 250 feet southeast of SA 43E. Fort Devens records document that the gasoline UST and associated fill pipes and concrete collars were removed prior to the construction of the PX (Army and Air Force Exchange Service [AAFES], 1973).

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3.0 RELATED INVESTIGATIONS

3.1 MASTER ENVIRONMENTAL PLAN

SA 43, the Historic Gas Station Sites, was identified as a possible source for release of contaminants into the environment. The 19 gas stations were identified from a circa 1941 map (Barbour, 1941). The MEP recommended that the remaining USTs be located, and residual contamination in soil be removed (Biang, et al., 1992).

3.2 ENHANCED PRELIMINARY ASSESSMENT

The PA included a review of the study and recommendations presented in the MEP and considered other areas that might require evaluation due to the closure of Fort Devens. No additional findings or recommendations for SA 43F were provided in the PA.

3.3 SITE INVESTIGATION REPORT

The SI was initiated in June 1992 and included the following 13 Group 2 and 7 originally identified SAs listed in the MEP.

- SA 13 Landfill No. 9
- **SA 43 Historic Gas Stations (19 Sites)**
- SA 45 Lake George Street Vehicle Wash Area
- SA 49 Building 3602 Leaking Underground Storage Tank (LUST) Site
- SA 56 Building 2417 LUST Site
- SA 57 Building 3713 Fuel Oil Spill
- SA 58 Buildings 2648 and 2650 Fuel Oil Spills
- SA 12 Landfill No. 8
- SA 14 Landfill No. 10
- SA 27 Waste Explosive Detonation Range (Hotel)
- SA 28 Waste Explosive Detonation Range (Training Area 14)
- SA 41 Unauthorized Dumping Area (Site A)
- SA 42 Popping Furnace

The SI was conducted by ABB-ES under contract with the USAEC. The Final Site Investigation Report was issued May 1993. The purpose of the SI was to verify the presence or absence of environmental contamination and to determine whether further investigation or remediation was warranted.

The SI field investigation program for SA 43F consisted of collecting subsurface soil samples and soil gas samples for field analysis. Surficial geophysical surveys were not conducted at SA 43F because the historic gas station is located under the current PX building.

Nine TerraProbe points were advanced along the three accessible sides of the PX building to seek evidence of possible migration of residual contamination away from the site of the historic gas station (see Figure 2-2).

Seven soil samples were collected from 9 feet and three soil samples were collected from 15 feet. Only one sample was collected from 20 feet due to subsurface obstructions. All of the soil samples collected from SA 43F were analyzed in the field for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbon compounds (TPHC). Because the water table was not reached in any of the soil sampling TerraProbe points, soil gas samples were collected from all nine locations and field-screened for BTEX only. No soil borings or monitoring wells were completed at this site.

4.0 CONTAMINATION ASSESSMENT

Subsurface soils and soil gas were sampled and analyzed on site during the SI field investigation. These results are summarized in the following paragraphs.

4.1 SOILS AND SOIL GAS

The objective of the TerraProbe subsurface soil sampling and field screening program was to determine if the historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43F. Seven subsurface soil samples were collected from 9 feet to analyze the shallow soil for fuel-related contaminants. BTEX was not detected in any of the samples and TPHC was detected in TP-04 at 87 parts per million (ppm) (Figure 4-1). Three soil samples were collected from 15 feet and one soil sample was collected from 20 feet. BTEX as not detected in any of the samples and TPHC was detected at 250 ppm in the sample collected from 15 feet below ground surface at TP-05 (Figure 4-2).

Because the TerraProbe borings met refusal without encountering groundwater, the sampling logic established for SA 43 required that soil gas samples be collected. Nine soil gas samples were collected and field-screened for BTEX only. BTEX was not detected in any of the soil gas samples collected from SA 43F (Figure 4-3). The field screening results are presented in Table 4-1.

4.2 GROUNDWATER

Groundwater was not encountered at SA 43F.

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5.0 PRELIMINARY HUMAN HEALTH RISK EVALUATION

The UST at SA 43F was removed around 1973. Field screening of 11 TerraProbe soil samples revealed no measurable concentrations of BTEX to a depth of 20 feet. No measurable concentrations of BTEX were detected in the nine TerraProbe soil gas sampling stations. TPHC was detected above the method detection limit in two of the 11 soil samples, at 87 ppm and 250 ppm. Comparing the measured TPHC results against the calculated risk-based commercial/industrial concentration value of 1,700 ppm for gasoline, and against the Massachusetts Contingency Plan's most conservative concentration of 500 ppm, there should be no significant risk to public health from soil contamination at SA 43F.

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6.0 PRELIMINARY ECOLOGICAL RISK EVALUATION

A preliminary ecological risk evaluation was not prepared for SA 43F because contaminants associated with a UST would be confined to subsurface soil, and would not impact any ecological receptors.

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7.0 CONCLUSIONS

The objective of the field investigation at SA 43F was to determine if the former historic gas station activities had adversely impacted the soil or groundwater quality in the area around SA 43F. Based on the results of the subsurface soil sampling program and the field analyses, it does not appear that the past activities at SA 43F have impacted soil quality in the vicinity of the former UST location. Therefore, no further action is recommended for this historic gas station.

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8.0 DECISION

On the basis of the findings at SA 43F, there is no evidence or reason to conclude that petroleum contamination from the former UST has caused significant environmental contamination or pose a threat to human health or the environment. The decision has been made to remove SA 43F from further consideration in the IRP process. In accordance with CERCLA 120 (h) (3), all remedial actions necessary have taken place, and the USEPA and MADEP signatures constitute concurrence in accordance with the same.

James C Chambers — 18 JAN 95

JAMES C. CHAMBERS
BRAC Environmental Coordinator
Date

U.S. ENVIRONMENTAL PROTECTION AGENCY

James P. Byrne — 1/18/95

JAMES P. BYRNE
Fort Devens Remedial Project Manager
Date

[X] Concur

[ ] Non-concur (Please provide reasons for non-concurrence in writing)

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

D. Lynne Welsh — 1/18/95

D. LYNNE WELSH
Section Chief, Federal Facilities - CERO
Date

[X] Concur

[ ] Non-concur (Please provide reasons for non-concurrence in writing)

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AAFES	Army and Air Force Exchange Service
ABB-ES	ABB Environmental Services, Inc.
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	U.S. Department of Defense
gpm	gallons per minute
IRP	Installation Restoration Program
LUST	leaking underground storage tank
MEP	Master Environmental Plan
MSL	mean sea level
PA	Enhanced Preliminary Assessment
ppm	part per million
PX	Post Exchange
SA	Study Area
SI	site investigation
TPHC	total petroleum hydrocarbon compounds
USAEC	U.S. Army Environmental Center
UST	underground storage tank
VOC	volatile organic compound

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Army and Air Force Exchange Service (AAFES), 1993. "Community Center Main Store & Warehouse, Fort Devens, Mass., Demolition Plan (As-Built)"; Drawing No. 73-EN-C-03, Sheet C-3; November 11.

ABB Environmental Services, Inc. (ABB-ES), 1993. "Final Site Investigation Report - Groups 2, 7, and Historic Gas Stations, Fort Devens, Massachusetts"; Data Item A009; prepared for the U.S. Army Environmental Center by ABB Environmental Services, Inc., Portland, ME, May.

Barbour, F.A., c. 1941. "Fort Devens, Mass. General Layout Plan"; Plan 6101-710.1B; prepared for Construction Division, Office of Quartermaster General; Scale approximately 1:7,000.

Biang, C.A., R.W. Peters, R.H. Pearl, and S.Y. Tsai, 1992. "Master Environmental Plan for Fort Devens, Massachusetts"; prepared for U.S. Army Toxic and Hazardous Materials Agency; prepared by Argonne National Laboratory, Environmental Assessment and Information Sciences Division; Argonne, IL; Final, April.

Jahns, R.H., 1953. "Surficial Geology of the Ayer Quadrangle, Massachusetts"; Scale 1:31,680; U.S. Geological Survey.

Koteff, C., 1966. "Surficial Geologic Map of the Clinton Quadrangle, Worcester County, Massachusetts;" U.S. Geological Survey Map GQ-567.

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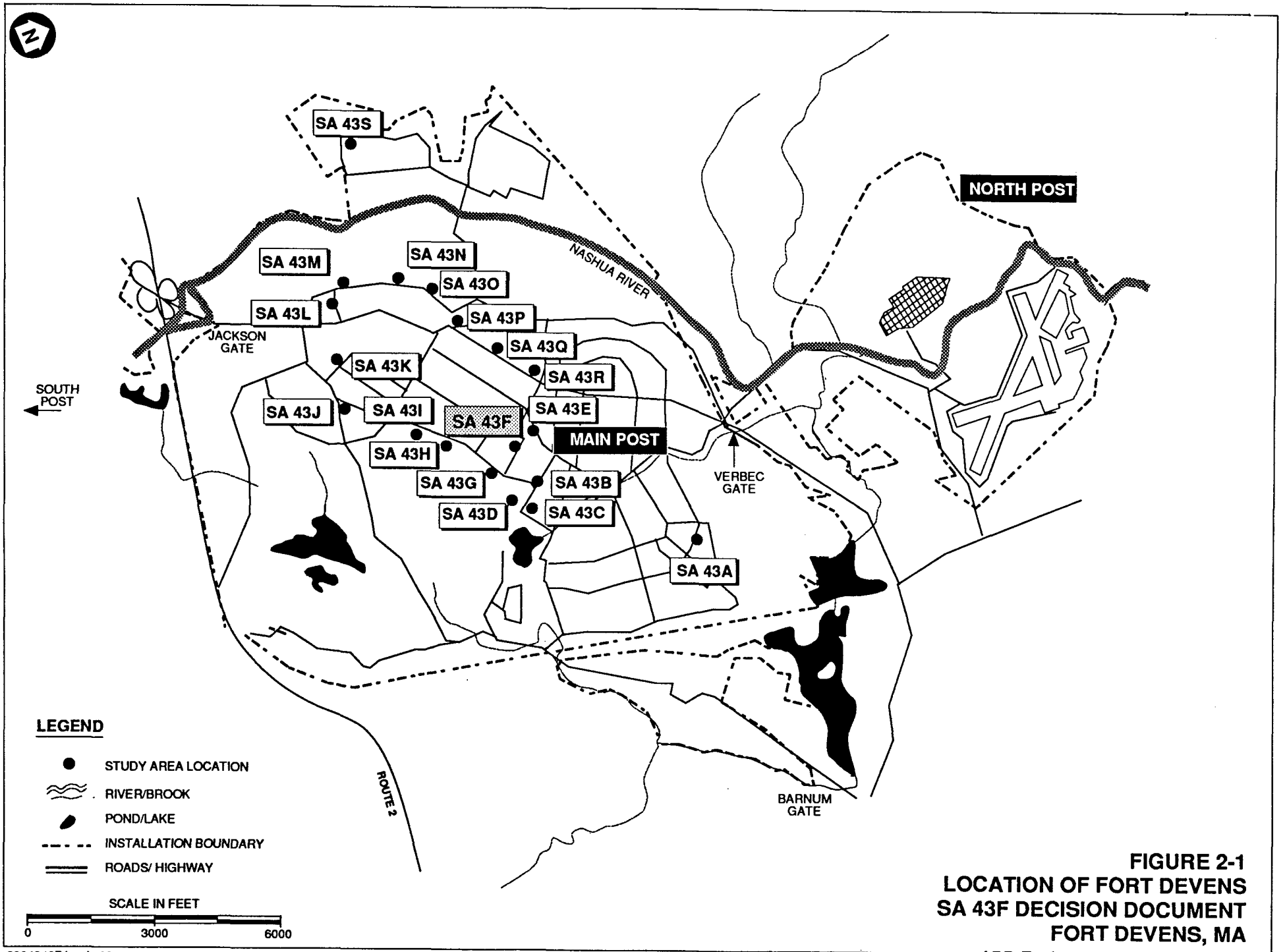

FIGURE 2-1
LOCATION OF FORT DEVENS
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

9304049D(wm) 23

ABB Environmental Services, Inc.

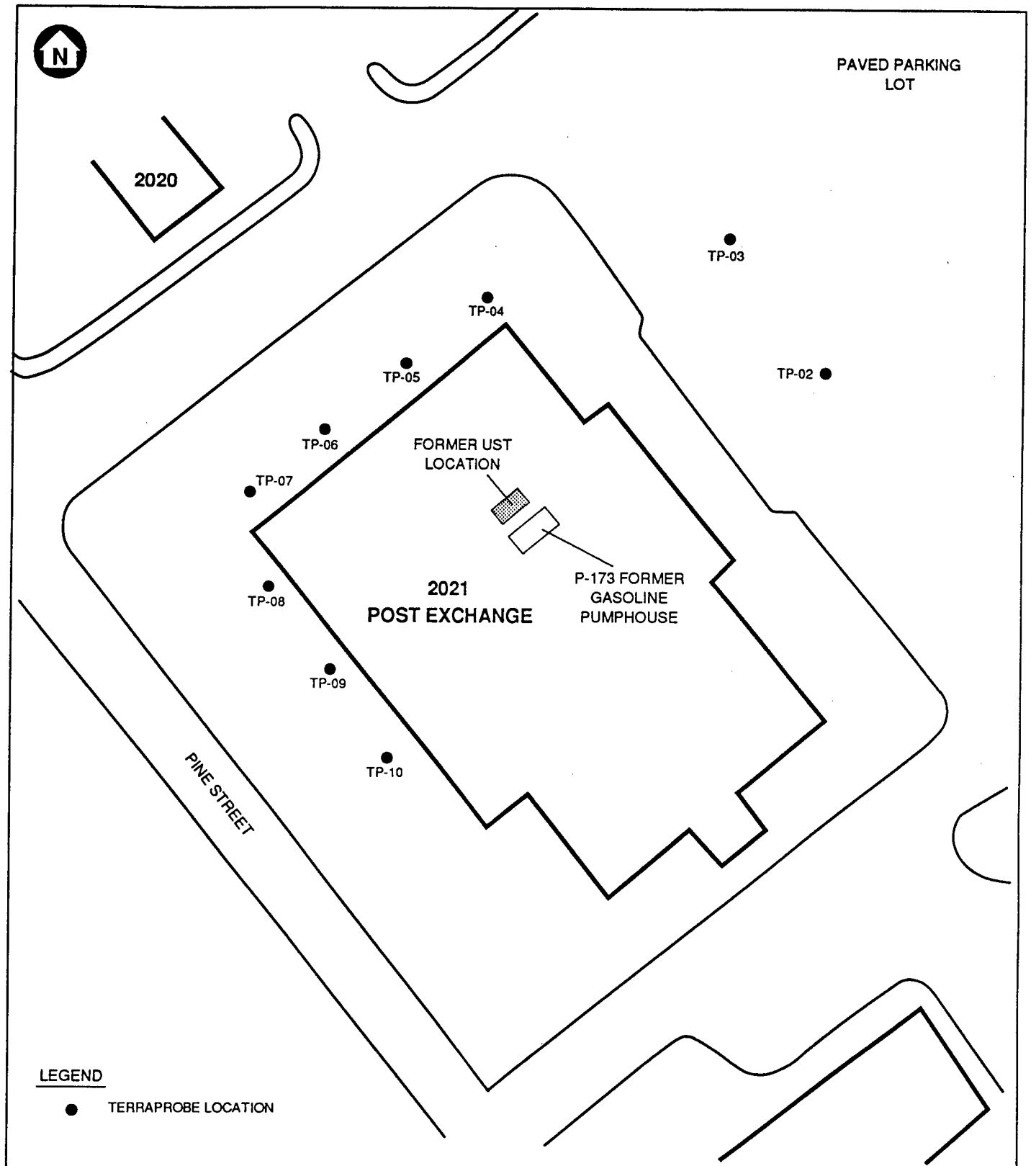

FIGURE 2-2
TERRAPROBE LOCATIONS
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

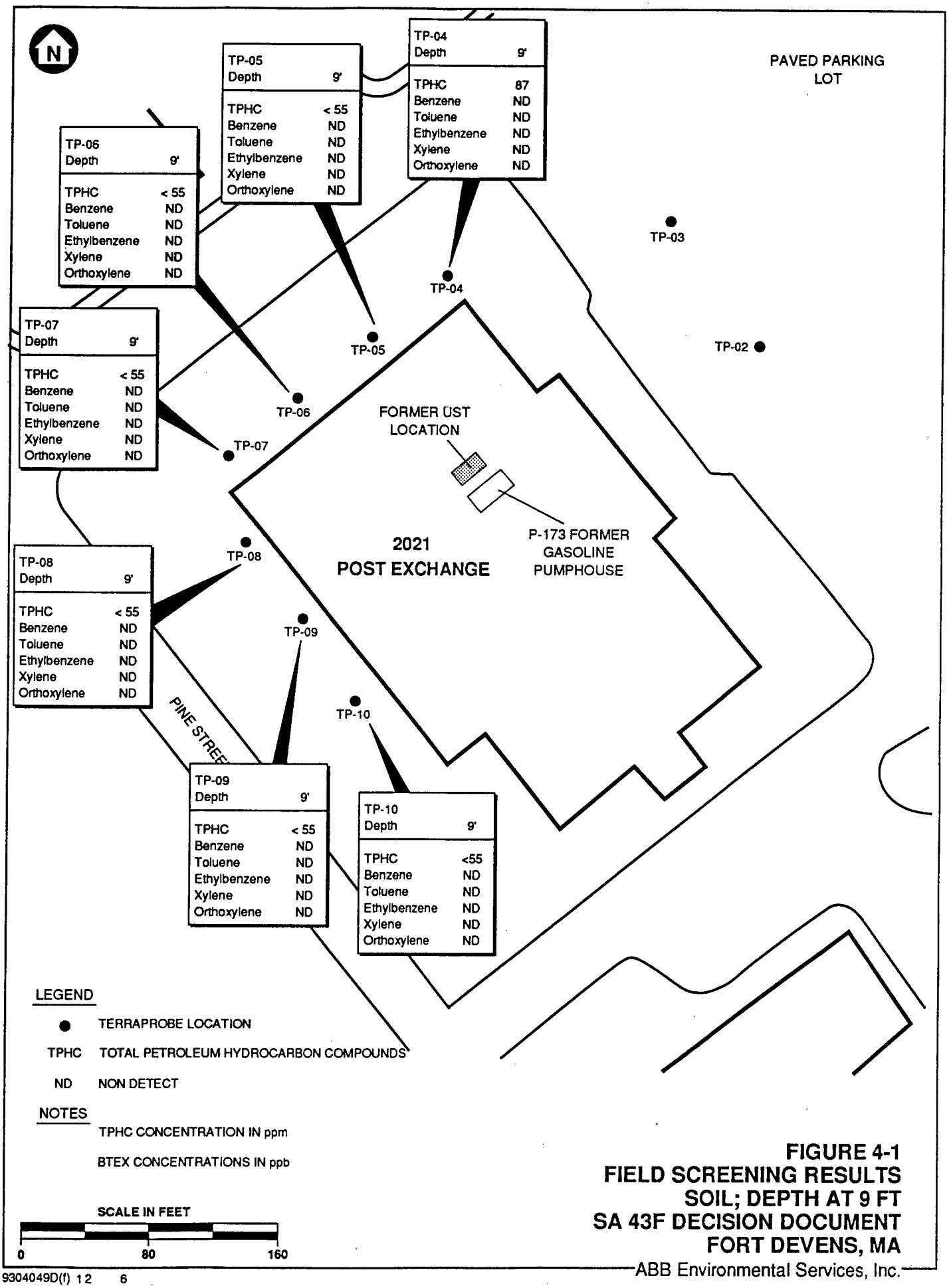

FIGURE 4-1
FIELD SCREENING RESULTS
SOIL; DEPTH AT 9 FT
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

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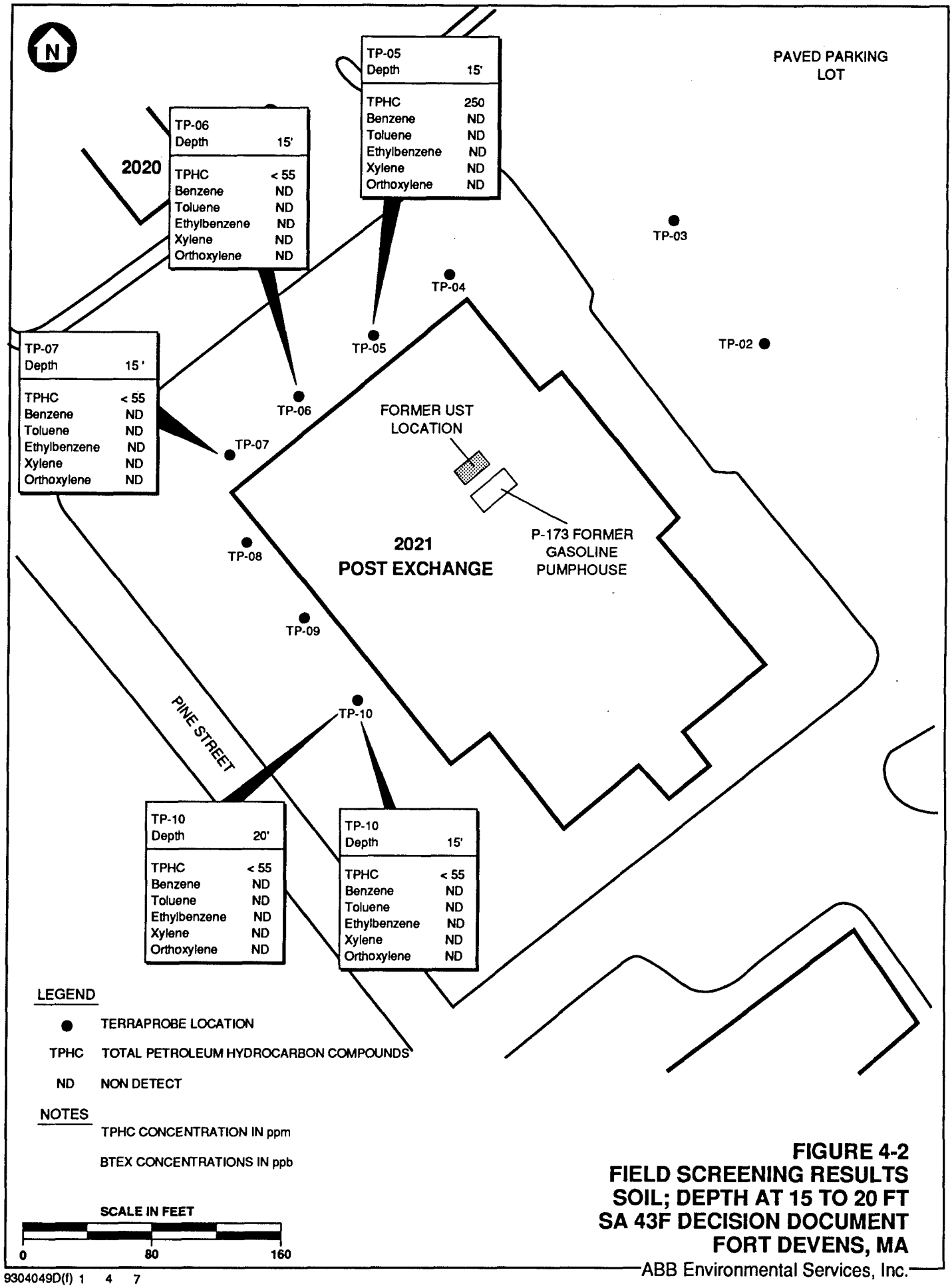

FIGURE 4-2
FIELD SCREENING RESULTS
SOIL; DEPTH AT 15 TO 20 FT
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

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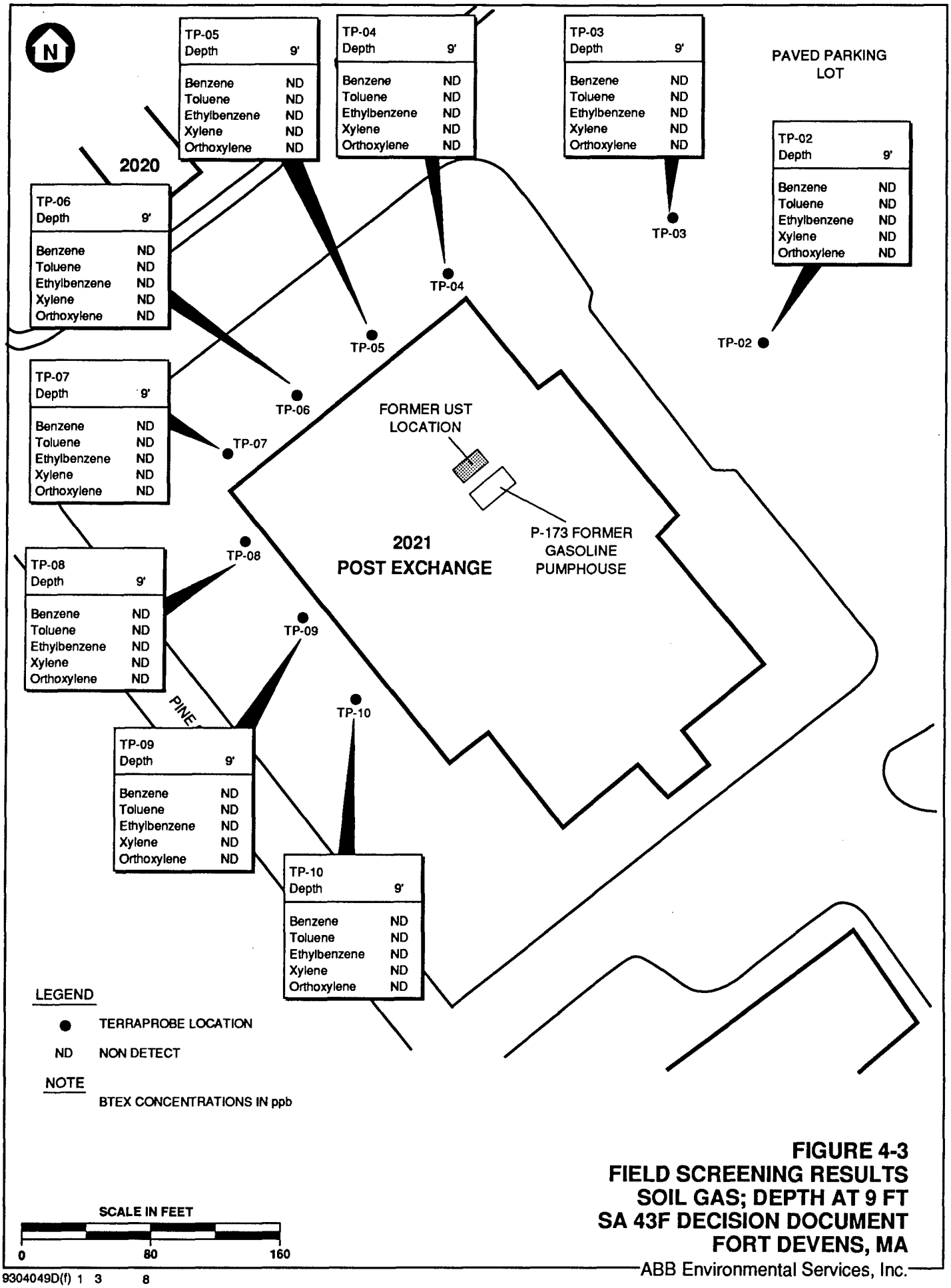

FIGURE 4-3
FIELD SCREENING RESULTS
SOIL GAS; DEPTH AT 9 FT
SA 43F DECISION DOCUMENT
FORT DEVENS, MA

ABB Environmental Services, Inc.

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TABLE 4–1
FIELD SCREENING RESULTS
SA 43F – HISTORIC GAS STATIONS

DECISION DOCUMENT
FORT DEVENS

SAMPLE ID	SA#	MEDIUM	SITE ID	DEPTH (feet)	TPHC ppm	TOTAL BTEX ppb	BEN* ppb	TOL* ppb	E–BEN* ppb	M/P XYL** ppb	O–XYL* ppb	COMMENTS
43TSF04XX901XF	43F	SOIL	TP–04	9	87	ND	ND	ND	ND	ND	ND	
43TSF05XX901XF	43F	SOIL	TP–05	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF05X1501XF	43F	SOIL	TP–05	15	250	ND	ND	ND	ND	ND	ND	
43TSF06XX901XF	43F	SOIL	TP–06	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF06XX901XF	43F	SOIL	TP–06	15	< 55	ND	ND	ND	ND	ND	ND	
43TSF07XX901XF	43F	SOIL	TP–07	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF07X1501XF	43F	SOIL	TP–07	15	< 55	ND	ND	ND	ND	ND	ND	
43TSF08XX901XF	43F	SOIL	TP–08	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF09XX901XF	43F	SOIL	TP–09	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF10XX901XF	43F	SOIL	TP–10	9	< 55	ND	ND	ND	ND	ND	ND	
43TSF10X2001XF	43F	SOIL	TP–10	20	< 55	ND	ND	ND	ND	ND	ND	
43TGF02XX801XF	43F	SG	TP–02	9	NA	ND	ND	ND	ND	ND	ND	
43TGF03XX801XF	43F	SG	TP–03	9	NA	ND	ND	ND	ND	ND	ND	
43TGF04XX801XF	43F	SG	TP–04	9	NA	ND	ND	ND	ND	ND	ND	
43TGF05XX801XF	43F	SG	TP–05	9	NA	ND	ND	ND	ND	ND	ND	
43TGF06XX801XF	43F	SG	TP–06	9	NA	ND	ND	ND	ND	ND	ND	
43TGF07XX801XF	43F	SG	TP–07	9	NA	ND	ND	ND	ND	ND	ND	
43TGF08XX801XF	43F	SG	TP–08	9	NA	ND	ND	ND	ND	ND	ND	
43TGF09XX801XF	43F	SG	TP–09	9	NA	ND	ND	ND	ND	ND	ND	
43TGF10XX801XF	43F	SG	TP–10	9	NA	ND	ND	ND	ND	ND	ND	

NOTES:

* = ND denotes a non detect or concentrations below 5 ppb.

** = ND denotes a non detect or concentrations below 10 ppb

\# = Study area

SG = Soil gas

NA = Not applicable

PPM = Part Per Million

PPB = Part Per Billion

TP = TerraProbe

TPHC = Total Petroleum Hydrocarbon Compounds

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

BEN = Benzene

TOL = Toluene

E–BEN = Ethylbenzene

M/P XYL = M/P Xylenes

O – XYL = O – Xylenes